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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,218	04/14/2005	Masanobu Seki	CU-4148 RJS	6993
26530	7590	07/31/2009	EXAMINER	
LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1600 CHICAGO, IL 60604			MAKI, STEVEN D	
			ART UNIT	PAPER NUMBER
			1791	
			MAIL DATE	DELIVERY MODE
			07/31/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/531,218	SEKI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Steven D. Maki	1791	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 April 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

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1) The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Incorporation of "a foaming agent to produce a foam having bubbles", "the foam having bubbles", "a foam having bubbles with desired sizes", "agents for increasing sizes of pores formed by bubbles in the foamed gypsum slurry", and "agents for decreasing sizes of pores formed by bubbles in the foamed gypsum slurry" from claim 1 into the specification.

2) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3) Claims 1 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, there is no antecedent basis for "the board-shaped one" (line 11) and "the dried and shaped one" (line 12). In claim 11, it is suggested to (1) on line 11 change "the board-shaped one" (line 11) to --the board-shape-- and (2) on line 12 change "the dried and shaped one" to --the dried board-shape--.

4) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5) **Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (specification page 1 lines 19-33, page 2 lines 1-12) in view of Sucech (US 5,643,510) and Japan (JP 10-330174).**

The admitted prior art discloses a process for manufacturing a foamed gypsum board comprising:

blowing air into a foaming agent to form a **"preliminarily produced foam"**  
**(foam having bubbles);**

obtaining a foamed gypsum slurry by mixing the "preliminarily produced foam" into a kneaded material containing calcined gypsum, adhesive, additives and water;

pouring the foamed gypsum slurry into a space between upper and lower base papers;

passing the gypsum slurry covered with base papers through a shaping machine for determining the thickness and width of a gypsum board;

roughly cutting off the shaped strip-type gypsum board;

drying the rough cut gypsum board by passing it through a force drying machine;

cutting the dried gypsum board to a predetermined dimension.

The admitted prior art does not recite forming the preliminarily produced foam using a foaming agent and a pore size adjusting agent.

As to claim 1, it would have been obvious to one of ordinary skill in the art to obtain a **"foaming agent for producing foam having bubbles with desired sizes"** (**"pregenerated foam"**) by preliminarily adding a "pore size adjusting agent" such as

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ferric sulfate or aluminum sulfate to a stock solution of foaming agent so that when such a "foaming agent for producing foam having bubbles with desired sizes" is used in the admitted prior art process to form "preliminary produced foam" ("pregenerated foam"), the manufactured gypsum board (plaster board) has pores with desired size distributed in a gypsum core in view of (1) Sucech's suggestion to control void size (and thereby improve nail pull and strength) in a foamed gypsum board by forming a "pregenerated foam" from a **mixture** of a first stable foaming agent such as alkyl ether sulfate and a second unstable foaming agent such as alkyl sulfate before adding the foam to the gypsum slurry to form a foamed gypsum slurry to be placed between upper and lower base papers and (2) Japan's teaching to use a **combination** of frothing agent such as alkyl ether sulfate and foam adjusting agent such as ferric sulfate and aluminum sulfate to control size of air cells in a gypsum slurry, improve adhesion of the core to the paper and improve strength. Hence, the admitted prior art discloses the combination of steps of blowing air into a foaming agent to produce "foam" and then mixing the "foam" into kneaded material that contains calcined gypsum, adhesive, various additives and water. See page 1 lines 19-33 and page 2 lines 1-12 of the specification. Examiner acknowledges that the admitted prior art is silent as to the composition of the foaming agent. However, Sucech and Japan are not silent as to the composition of a foaming agent. In particular, Sucech et al and Japan disclose a composition comprising alkyl ether sulfate (the same foaming agent used by applicant in the example). Furthermore, Japan recommends using a foam adjusting agent such as ferric sulfate or aluminum sulfate for controlling the sizes of the cells in combination with alkyl ether sulfate.

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Desired cell sizes comprising comparatively larger cells (Figures 1, 2) and improved adhesion of the core to the paper are obtained. With respect to combining foaming agent with an agent for adjusting cell size, Sucech teaches mixing the two agents just prior to feeding them into the foam generator (col. 3 lines 17-18) and Sucech et al teaches generating foam from a mixture of liquid foaming agent, air and water in a suitable foam generating apparatus (col. 1 lines 18-20). Thus, the admitted prior art, Sucech et al and Japan when considered as a whole teach the claimed composition, preliminarily adding step, blowing air step and mixing step. It is emphasized that the claimed foaming agent and pore adjusting agent read on the frothing agent and foam adjusting agent respectively disclosed by Japan. More specifically, the claimed foaming agent reads on alkyl ether sulfate and the claimed pore size adjusting agent reads on ferric sulfate or aluminum sulfate as disclosed by Japan. There is no difference in composition. It is emphasized that Sucech teaches mixing the first foaming agent and second foaming agent to form a mixture and then combining this mixture with air in a foam generating apparatus to form a foam and then adding the foam to the slurry. The admitted prior art substantially discloses the claimed invention (including the rough cutting step) except for the use of two agents to form the pregenerated foam. Both Japan and Sucech teach the use of two agents. When using two agents, Sucech motivates one of ordinary skill in the art to mix the agents and then combine this mixture with air in a foam generating apparatus to form a foam and then add the foam to the slurry. In summary, the applied prior art renders obvious modifying the admitted prior art process by using a composition comprising alkyl ether sulfate and foam adjusting

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agent such as ferric sulfate or aluminum sulfate as disclosed by Japan and making the pregenerated foam comprising the composition using the steps disclosed by Sucech.

With respect to amount of "pore size adjusting agent" (claims 1 and 4), it would have been obvious to add **0.00001 parts to 0.005 parts** by weight of a pore adjusting agent such as ferric sulfate or aluminum sulfate to the foaming agent in view of Japan's suggestion to obtain lightweight plaster board having improved adhesion of the core to the paper and improved strength by using an amount **0.001 parts to 1.0 parts** "foam adjusting agent" (pore size adjusting agent) for controlling size of air cells in gypsum slurry such as ferric sulfate and aluminum sulfate and a frothing agent ("foaming agent") such as alkyl ether sulfate. See abstract and paragraphs 7-9 and 14-20 of machine translation, Figure 1 and Figure 2 and claims 3 and 5 of machine translation. The range of 0.001 to 1.0 disclosed by Japan overlaps the claimed range of 0.00001 to 0.005. It is emphasized that Sucech and Japan disclose using alkyl ether sulfate as a foaming agent and that Japan teaches using foam adjusting agent such as ferric sulfate or aluminum sulfate in combination with alkyl ether sulfate. It is emphasized that the claimed pore size adjusting agent reads on aluminum sulfate and ferric sulfate as disclosed by Japan. See claim 4. It is noted that Japan teaches that uniform and comparatively big bubbles / big closed cells are formed. See paragraph 7 of machine translation and Figures 1 and 2. From a comparison of invention Figures 1 and 2 with comparison figures 3 and 4, it can be seen that the resulting pores in the gypsum board are relatively large.

Applicant states "Examiner rejects the claims as obvious under 35 U.S.C. 103(a) over the disclosure in the specification on page 1, lines 19-23, page 2 lines 1-12, in view of Sucech, U.S. 5,643,510, and in view of Diez et al., U.S. 5,240,639" (page 4 of response filed 4-24-09). Applicant's statement of the rejection is incorrect. The correct statement of the rejection is "Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (specification page 1 lines 19-33, page 2 lines 1-12) in view of Sucech (US 5,643,510) and Japan (JP 10-330174)." See page 3 of last office action dated 1-27-09. With respect to the response filed 4-24-09, it is readily apparent that applicant means "Japan" instead of "Diez et al" when discussing paragraphs 8 and 9. It is also readily apparent that (1) applicant means "Japan" instead of "Sucech" when discussing claim 3 and (2) applicant means "Japan" instead of "Diez et al" when discussing claim 5.

Applicant argues that Sucech does not disclose the claimed pore size adjusting agent. More properly, Sucech suggests controlling void size using a "pregenerated foam" formed from a mixture of two different foaming agents and, moreover, Japan suggests forming desired size pores using a foam adjusting agent. The foam adjusting agent may be ferric sulfate or aluminum sulfate. It is undisputed that the claimed "pore size adjusting agent" reads on each of ferric sulfate and aluminum sulfate.

Applicant acknowledges the following: (1) Japan discloses "A foam stabilizer as referred to in the present invention means a compound having a deforming effect or foam breaking effect". (2) With respect to a foam breaker (compound having a foam breaking effect) such as iron or aluminum sulfate, Japan discloses "generally ... in case



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or a foam breaker, it is in a range of 1.0 part by weight or less, per 100 parts by weight of calcined gypsum, wherein ... in case of a foam breaker, it is preferably in a range of 0.1-0.5 parts by weight". (3) Claim 3 of Japan discloses "the foam stabilizer is a polyvalent metal sulfate". (4) Claim 5 of Japan discloses "the mixing amount of the foam stabilizer is 0.001-1.0 parts per weight per 100 parts by weight of calcined gypsum constituting the core material". See pages 6 and 7 of response filed 4-24-09. With respect to claims 3 and 5 of Japan, the following information was obtained during a partial oral translation by a USPTO translator: Claim 3 describes "the foam regulating agent is a sulfuric acid salt compound of a multivalent metal". Claim 5 describes "the foam regulating agent is 0.001-1.0 parts by weight per 100 parts baked gypsum".

Applicant argues that Japan fails to disclose using 0.00001 to 0.005 parts pore adjusting agent comprising ferric sulfate or aluminum sulfate. This argument is not persuasive. When read as a whole, Japan fairly teaches using 0.001 parts pore adjusting agent comprising ferric sulfate or aluminum sulfate. Japan broadly discloses a foam regulating agent ("foam adjusting agent", "foam stabilizer"). Japan describes sulfuric acid salt compounds of multivalent metals as having a foam breaking effect. Japan broadly discloses 1.0 parts by weight or less of foam breaking effect. Hence, Japan broadly discloses using less than 1 part foam regulating agent ("foam adjusting agent", "foam stabilizer") comprising ferric sulfate or aluminum sulfate. In this broad disclosure, a lower limit of 0.1 is not set. Claims 3 and 5 use the same phrase "foam regulating agent" ("foam stabilizer") to describe the amount of 0.001 to 1.0 parts by weight and sulfuric acid salt compound of a multivalent. Although claim 5 is not

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dependent on claim 3 as correctly noted by applicant, one of ordinary skill in the art would readily appreciate that the range of 0.001 to 1.0 parts is applicable to ferric sulfate and aluminum sulfate since (1) Japan broadly describes a foam regulating agent ("foam adjusting agent", "foam stabilizer") as having a defoaming effect or a foam breaking effect, (2) when discussing a foam breaking agent, Japan broadly discloses a range of less than 1 part, (3) claims 3 and 5 use the same phrase "foam regulating agent" ("foam stabilizer") to describe the amount of 0.001 to 1.0 parts by weight and sulfuric acid salt compound of a multivalent and (4) claim 3, directed to the embodiment of ferric sulfate or aluminum sulfate, uses the language of foam regulating agent ("foam adjusting agent", "foam stabilizer") instead of foam breaking agent. It is acknowledged that Japan describes a preferred range of 0.1 to 0.5 parts by weight for the foam breaking agent. However, "...case law does not require that a particular combination must be the preferred, or the most desirable, combination described in the prior art in order to provide motivation for the current invention" In re Fulton 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

#### Remarks

- 6) Applicant's arguments filed 4-24-09 have been fully considered but they are not persuasive. Applicant's arguments are addressed above.
- 7) No claim is allowed.
- 8) Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/  
Primary Examiner, Art Unit 1791

Steven D. Maki  
July 29, 2009